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TITLE : SPUTTERING SINTERED TARGET MATERIAL FOR FORMING GE-SI THIN FILM OF SEMICONDUCTOR DEVICE

ABSTRACT : PROBLEM TO BE SOLVED: To form a Ge-Si thin film having uniform film thickness over a wide area at a high speed by sputtering by producing a sintered target material with a solid phase sintered structure in which Si-B particles contg. a specified amt. of B as solid solution and pure Ge particles are mutually dispersed and joined in a specified ratio.

SOLUTION: High purity Si is blended with, by weight, 0.01 to 1.0% high purity B, and melting is executed in an Ar atmosphere in a quartz crucible to obtain Si-B solid solution. This is cooled to solidify and is thereafter pulverized by a jaw crusher and a ball mill. This Si-B particles of 5 to 50% is blended with high purity Ge particles, and mixing is executed by a ball mill. This powdery mixture is filled into a graphite mold and is subjected to vacuum press sintering at about 930 to 1150°C, under about 150 to 250 kgf/cm² and for about 3 hr in a vacuum atmosphere of about 5×10^{-2} Torr. The sintered target material with a solid phase sintered structure in which the Si-B particles and Ge particles are mutually dispersed and joined obtd. by this is used, and sputtering is executed to form a Ge-Si series thin film having a large area and uniform film thickness of a semiconductor device at high speed.

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